

## **Pre-college Students Contribute to the Cassini-Jupiter Millennium Flyby**

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December 30, 2000 marks the close approach of the Cassini-Jupiter Millennium Flyby when the Cassini spacecraft swings past the planet Jupiter on the way to Saturn. While instruments on the spacecraft conduct new observations of Jupiter from relatively close range, middle-school and high-school students from classrooms across the nation will be observing Jupiter using ground-based 34-meter-diameter radio telescopes at Goldstone. The students and their teachers are participants in the Goldstone-Apple Valley Radio Telescope (GAVRT) science education project, which is a partnership involving NASA, the Jet Propulsion Laboratory and the Lewis Center for Educational Research (LCER) in Apple Valley, CA.

GAVRT students and their teachers will join a collaboration of professionals to carry out the Cassini-Jupiter Microwave Observing Campaign (Cassini-JMOC) from November 2000 through February 2001. Cassini-JMOC is a scientific investigation of Jupiter designed to take advantage of the in-situ microwave observing capability of the Cassini radar receiver to carry out a coordinated set of space-based and ground-based observations. The ground-based data will be used to calibrate and interpret the spacecraft observations of Jupiter, which have two objectives: (1) produce in-flight calibration of the Cassini radar receiver and thereby enhance the Cassini science at Saturn and Titan; (2) use the Cassini radar receiver to map Jupiter's synchrotron emission at a frequency above 10 GHz and thereby derive the spatial distribution of very high energy electrons ( $>20$  MeV) for the first time.

The goals of the Cassini-JMOC effort are to enhance the science return from the Cassini experiment and simultaneously provide new and unique opportunities for students to participate in an exciting scientific event. The data products from the GAVRT observations will be "real". Student results will be reviewed by the Cassini-JMOC team, but they will ultimately be reported to the Cassini Project for use by the project science teams.

This paper describes the GAVRT project, reports the observations of Jupiter which GAVRT students have conducted from 1997 to 2000, and describes the scientific and educational approach to the Cassini-JMOC observations that will be made in the next few months.

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